Water Quality
Lesson 2
Classroom and Study Site of Choice

Introduction to Hydrology

Learner Outcomes

The learner will

- Observe water at the chosen study site.
- Describe water at the study site.
- Organize observations.
- Ask questions based on observations at the study site.
- Identify relationships between land characteristics and water characteristics.
- Communicate initial observations and interpretations orally, in writing and graphically.
- Map the hydrology study site.

Background

A body of water is part of a catchment basin. A watershed delineates a catchment basin, the area drained by a river and its tributaries. The topography of the area determines the shape of the watershed. The surrounding land and the uses of this land – towns, cities, highways, agriculture, livestock, timber harvesting, natural vegetation, etc. -- influences the water chemistry of bodies of water within the watershed.

Many factors can affect the characteristics of the water in a river system, lake, or pond. Characteristics of water include: temperature, color, shape, etc. Students will be collecting data about water quality as measured by dissolved oxygen, pH, alkalinity and electrical conductivity. Field observations increase the students' ability to conceptualize links between land and water characteristics. This activity is an introduction to water quality monitoring and lays the foundation for subsequent activities.

Materials

- Supplements 5.1, 5.2
- Drawing materials and tools for creating pictures and maps
- Science journals and pens
- Still or video cameras for photography
- Compass and measuring sticks or twine
- Clear plastic cups or bottles for clarity and color of water
- Poster boards
- Markers

Assessments

- Pre-test
- Students will create a visual display of what they know about the body of water, including surrounding land uses and their impacts on the quality of the water (both

positive and negative) in ways that affect wildlife and humans. Share this with others at school and in the community.
- Field journals
- Maps

Activity #1
Initial Field Experience
6 hours

Procedure
- Obtain topographic maps and satellite imagery of study site.
- Assign teams of students to survey separate sections of the study site.
- In teams composed of a journalist, a mapper, a sketcher and a photographer, instruct teams to begin documenting what they observe about their section.
- Instruct teams to record the appearance, smell and general nature of the water.
- Instruct teams to record the use of bordering lands: urban, agricultural, residential, desert, etc.
- Have teams map general contours and characteristics of their sections and record the wildlife and plants in and around the water.
- Instruct teams to record the slope of the land adjacent to their section of water.

Activity #2
Making Sense of Water
2 class periods

Procedure
- Have students create a composite display of all maps.
- Ask students to look for similarities and differences and discuss observed patterns.
- Encourage students to brainstorm about how water got to this location, how it flows through the entire site, where it goes from there, how the area surrounding the water influences the quality of the water particularly during periods of rain, snowmelt, flooding, etc.
- Allow students to record questions that they have on tagboard and post on the classroom wall.
- Lead student discussion into some of the following areas:
  What land use activities did you observe and list?
  How do you think these activities would change the water characteristics?
  Would these activities influence water quality?
  What type of water appearance was recorded most often and what might this indicate about the water quality?
  Was there evidence of human uses of the water?
  Was there evidence of wildlife using the water?

Activity #3
Post Test
20 minutes

Procedure
The teacher will
- Administer post-test to access knowledge gained.

Further Investigative Activities

- Students can visit the site on a monthly, bimonthly, or otherwise scheduled basis to collect data. Remind them of their observations during this activity and ask them to note changes in their field journals.
- Take composite information about the study site and prepare a written description of the features and characteristics, including such materials as graphs of hydrology data.
- Contact another school that has reported data, and make arrangements to have them graph their hydrology data.
- Exchange and compare the graphs of the data from both schools. Each should then prepare a written description of the other's initial study site based on the comparisons. Then exchange the written descriptions and discuss how the extrapolated descriptions compare with the original descriptions.
- Explore the things that can and cannot be concluded from the data.

Acknowledgment
Adapted from The Aspen Global Change Institute's *Ground Truth Studies Teacher Handbook*, *River Walk,* Project WET's *Stream Sense* and GLOBE *Hydrology Investigation.*